was headed by James R. Killian, chairman of the board of M.I.T. and former science adviser to President Eisenhower. He has served for some time on the ESI board.

Killian said it is "obsolescence that I think is the core of our problem in dealing with innovation," and he suggested that ESI could be regarded as the "real prototype of the laboratory that is proposed in this bill . . ." (in Title IV).

The key to the success of ESI's projects, Killian said, was its close relations with both universities and school systems. "Most importantly," he said, "from inception, ESI has served as a vehicle for confederating scholars and teachers from a number of institutions, both universities and precollege, who are willing to work cooperatively in an interdisciplinary pooling of talents."

Carnegie Corporation staff member Arthur Singer also referred to the model of PSSC–ESI and other curriculum reform efforts in biology, chemistry, and mathematics achieved by the alliance of university scholar and school teacher when he said, "The most successful innovations are those which are accompanied by the most elaborate help to teachers as they begin to use new materials or new methods of teaching."

Keppel, in his statement, indicated the desire to enlist the services of able researchers from a variety of institutions beyond the regular public education ambit when he said, "Under Title IV, authority would also be granted to employ the competence of research organizations and professional associations."

It should be recognized, however, that there is a real reluctance on the part of some federal legislators to accept the kind of development envisioned in the administration bill. At the root of this reluctance is the issue of federal control, based on the fear that federal support of research could result in "centralized curriculum" planning being imposed on the schools.

A colloquy between Representative Alphonzo Bell (R–Calif.) and Dr. David Page, one of the leaders in mathematics programs at ESI, illustrates some aspects of this controversy.

Bell offered the opinion that if federal funds were made available with only the requirement that they be used for educational purposes, "the States and local governments . . ., if they had the wherewithal, would know better how to develop a curriculum and how to use it than having the curriculum set up by a commissioner."

In response, Page said he "would like to say a few words, perhaps a few harsh words. Most of the exciting and worthwhile curriculum developments in the last 10 years have been accomplished through the pooling of the talents of professional physicists and people of the scholarly disciplines. It is not obvious that the people in whose hands the money would be placed could get in touch with such people."

Bell then observed, "In my state it is certainly true that the people who represent the school boards are usually elected by the local people in the school areas. Are you saying, in effect, that these public servants and the people who elect them do not know more about their individual problems than the people in Washington?"

To which Page replied, "They know more about their local individual problems, but they may not know enough about physics and mathematics and so on, to solve these problems."

There are, of course, severe limits on what federal legislators can do to foster the relationship between those who perform first-rate educational research and those who operate the schools. At least until very recently, the volume of outstanding research has been meager and the pace of innovation in the schools very slow. A bill of the kind proposed would no doubt encourage innovation in the schools simply through the emphasis on research and the provision of funds. But in light of the limited research manpower now available and of the experience of successful research projects outside the regular school structure, the encouragement only of "do-it-yourself" research projects by school districts and state departments would vitiate the effects of the program.

In the case of the key supplementary educational centers, however, an amendment written in executive session by the House subcommittee seems to offer a viable compromise by placing control of the centers in the hands of regular school authorities but leaving the way open for participation by researchers from outside.

As this was written, it was impossible to gauge how hot the fires of opposition would grow. The future of the bill still seemed to depend on maintaining a consensus among the major educational groups. The legislators who support the measure are involved in the delicate task of finding ways to respond to objections raised on the grounds of the church-state issue and federal control and, at the same time, achieving the purposes of the bill. (In both House and Senate there seems to be an expectation that the bill, if it passes, will probably make a trip to the courts, a destination long prophesied for school-aid bills.)

The new school bill inevitably raises constitutional, political, and educational problems, and the difficulty with it is that changes which may help with one set of problems may hinder with the others.—JOHN WALSH

Announcements

The **University of Rochester** has announced the first major revision of its Medical School curriculum since its opening in 1925. Rochester's revised curriculum will offer: (i) a tutorial program, to bring students into continuing close association with a senior faculty member in small-group teaching situations; (ii) a program of elective courses, enabling the student to "explore areas of medicine that excite his interest"; (iii) a new type of combined M.D.-Ph.D. program for the student who wishes training in depth both as a physician and as a medical scientist; and (iv) increased emphasis on interdepartmental teaching through new courses designed to present an interdisciplinary view of basic medical concepts. In addition, the medical school will expand its "year out" program, enabling students to spend a year in independent work. Further information on the revisions and programs is available from Donald G. Anderson, Dean of the School of Medicine, University of Rochester, Rochester, New York.

The University of Michigan has announced plans for the establishment of a **Center for Human Growth and Development**. It will coordinate work now being carried on in the schools and colleges of education, literature, science and the arts, medicine, public health, social work, and dentistry. The Center will focus on selected aspects of development through childhood, adolescence, middle age, and old age. Further information on the Center is available from Robert E. Moyers, who will be the Center's director. He is professor of dentistry at the University of Michigan, Ann Arbor.

Meeting Notes

The Air Force Cambridge Research Laboratories, Massachusetts, invites papers for the third symposium on **plasma electromagnetics of hypersonic flight.** Unclassified sessions will be held in Boston 21–22 September; classified sessions, the following day in Bedford. The topics to be covered include: wave propagation in plasma media, radiation patterns and impedance of plasma-covered antennas, reentry physics research, voltage breakdown of antennas at high altitude, diagnostic techniques for ionized flow fields, reentry communication flight tests, reentry electronic countermeasures, and rocket flame attenuation. Deadline for receipt of 200-word abstracts: *20 March.* (Miss A. Cahill, Air Force Cambridge Research Laboratories, L. G. Hanscom Field, Bedford, Mass. 01731)

The ninth Latin American **chemical congress** is scheduled 1–8 August in San Juan, Puerto Rico. Papers not yet published outside the author's country will be considered for presentation. Abstracts of no more than 200 words are required in triplicate. Deadline for receipt of abstracts: *15 April.* (Secretary, 9th Latin American Chemical Congress, Box 2647, Rio Piedras, Puerto Rico)

Two **genetics symposiums** are being organized for this summer by the Czechoslovak Academy of Sciences. The G. Mendel memorial symposium, scheduled 4–7 August, will take place in Brno, and will include papers on the origin, development, and application of genetics.

The symposium on the mutation process will be held in Prague, 9–11 August. It will feature reports and discussions on the following: the mechanism of mutation and mutation-inducing factors; the physiology of gene and mutation expression; mutations in the population; and genetic variations in somatic cells. Additional information is available from Dr. M. Sosna, Secretary General of the Organizing Committee, G. Mendel Memorial Symposium, Na cvicisti 2, Prague 6.

Papers on the technical and applied aspects of engineering in the area below 150°K are invited for presentation at the 1965 **cryogenic engineering** conference 23–25 August at Rice University. The meeting will stress space technology. Abstracts of up to 200 words are required. Deadline: *1 May.* (K. D. Timmerhaus, Cryogenic Engineering Conference, Engineering Research Center, University of Colorado, Boulder)

Scientists in the News

The editors of *Modern Medicine* last month announced the recipients of the 1965 Distinguished Achievement Awards. The awards, initiated by the magazine in 1934, honor persons in the medical profession who make "great and continuing discoveries in medicine." The recipients for 1965 were:

Leona Baumgartner, assistant administrator for technical cooperation and research, Agency for International Development.

Oscar Creech, Jr., professor of surgery and chairman of the surgery department, Tulane University.

Derek Denny-Brown, professor of neurology, Harvard, and director of the neurological unit, Boston City Hospital.

A. Baird Hastings, professor emeritus of biological chemistry, Harvard, and head of the laboratory of metabolic research, Scripps Clinic and Research Foundation, La Jolla, Calif.

Hudson Hoagland, executive director of the Worcester Foundation for Experimental Biology, Shrewsbury, Mass.

Chester S. Keefer, professor of medicine, Boston University.

Willem J. Kolff, head of the department of artificial organs, Cleveland Clinic, and professor of experimental medicine, Cleveland Clinic Educational Institute.

Joseph L. Melnick, chairman of the department of virology and epidemiology, Baylor University.

Joseph P. Merrill, director of the cardiorenal section, Peter Bent Brigham Hospital, and associate clinical professor of medicine, Harvard.

Francis D. Moore, professor of surgery, Harvard, and surgeon-in-chief, Peter Bent Brigham Hospital.

Five senior foreign scientists have won National Science Foundation fellowships for teaching and research in U.S. universities during 1964–65. The recipients are:

Franz A. Drahowzal, professor of chemistry at the Technical University, Vienna, to spend 12 months at the University of Arkansas starting in February.

Frank R. Keogh, mathematics professor at the Royal Holloway College of the University of London, to work at the University of Kentucky, for 10 months beginning in September.

Takashi Nakada, director of the research laboratory of precision machinery and electronics at the Tokyo Institute of Technology, began a 9-month fellowship at Georgia Institute of Technology last October.

Robert Harold Stokes, chemistry professor at the University of New England, New South Wales, Australia, to begin in March on a 12-month fellowship at the University of Wisconsin.

Peter Jaffrey Wheatley, senior research chemist at the Monsanto research laboratories in Switzerland, to spend 5 months at the University of Arizona, starting this month.

James A. Shannon, director of the National Institutes of Health, was one of the five recipients of the 1964 Rockefeller Public Service Award. Shannon, whose nomination was in the field of "science, technology or engineering," received a $10,000 cash grant. The program is supported by John D. Rockefeller, III, and is administered by Princeton University.

Melvin Calvin, chemistry professor at the University of California, has won the Davy Medal from the Royal Society of Great Britain for his "pioneering work in chemistry and biology, and . . . elucidation of the photosynthetic pathway for incorporation of carbon dioxide in plants."

Marlowe G. Anderson, head of the biology department at New Mexico State University, has received the school's Westhafer award, for excellence in teaching. It is the school's highest award for a faculty member.

Clifford V. Harding, formerly associate professor of biology at Columbia University College of Physicians and Surgeons, has joined Oakland University in Rochester, Michigan, as chairman of the new biology department. **Walter L. Wilson** has become a professor of biology at the school; he had been an associate professor in the University of Vermont medical school.

The Research Corporation, of New York, has presented its 1964 award to **William M. Fairbank**, physics professor at Stanford University. He received the $10,000 prize for his work in the field of very low temperature physics, and "especially for the discovery of flux quantization."